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Lipsitz & McAllister, LLC 755 MAIN STREET MONROE, CT 06468			CHOW, CHIH CHING	
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2122

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/023,389	Applicant(s) MONZ ET AL.	
	Examiner Chih-Ching Chow	Art Unit 2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/149,571.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/14/2001</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is responsive to the application filed on December 14, 2001.
2. The priority date considered for this application is September 9, 1997, which is the filing date of the foreign patent application DE 197,39,559,7.
3. Claims 1-71 have been examined.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 8-9, 12, 18-24, 30, 36-41, 43-44, 47, 52-59, and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,315,523 by Naoki Fujita et al. (hereinafter "Fujita").

CLAIM

1. A method for generating a control program for a machine tool, said machine tool having at least one sequence of sets control data for the machining of a workpiece by means of operating units controlled by the control program, wherein:

a. for generating control program a virtual workpiece and at least one virtual operating unit are represented to a user by a data processing unit,

b. each individual, virtual operating addressed by the user and virtual action(s) are specified via a data input unit, and

c. the action(s) specified to each individual, virtual operating unit are converted automatically into sets control data of the control program by the data processing unit taking into account a machine and control configuration specified to it.

Fujita

Fujita teaches a control program for a machine tool in a prior art. In Fujita, column 1, lines 52-57, "the present invention provides a **numerical control apparatus** (*control program, virtual operating units*) having a work simulation function capable of **displaying** (*can be visualized*) both the **workpiece configuration change** and the **tool** (*machine tool*) **shift movement** on the same **display screen** (*item a, represented to a user*) in accordance with the execution of a numerical **control program**", further, see bottom of column 2 to top of column 3, "The non-volatile memory 14 stores data to be reserved even after an electric power is turned off. For example, the **data** (sets of control data) includes various parameters, tool correction amounts, pitch error correction amounts, and predetermined scales used in the scale determining process." For item b, see column 3, lines 5-8, "the CNC apparatus includes a **manual data input apparatus** 15. The data input apparatus 15 comprises a keyboard 16 having symbolic keys and numerical keys etc. for manually inputting various commands, drawing data, NC data and so on". And for item c, see Fujita, column 2, lines 44-46, "an auto-programming function for **automatically programming** an NC program in the form of an interactive communication with an operator (*action*

specified for each individual)", and column 3, lines 65-68, "ROM 32 storing a program for the auto-programming operation and data for generating an interactive data input screen, an SRAM 33 for temporarily memorizing various data, and a non-volatile memory 34 storing tool data, workpiece configuration data etc" (data converting and storing).

2. A method as defined in claim 1, wherein all of the virtual operating units of the machine tool are represented to the user in accordance with an actual machine configuration in the form of a machine display.

For the feature of claim 1 see claim 1 rejection. See claim 1 rejection about the displaying workpiece part, and see column 3, lines 19-22, "Under the display screen 18a, there is provided a plurality of soft keys (*represented to the user*). Each soft key is assigned a different functions so that it can be used selectively (*selectable*) depending on the operational modes of the CNC apparatus."

3. A method as defined in claim 2, wherein all of the virtual operating units and their virtual actions are represented, taking into account the machine and control configuration of the machine tool.

For the feature of claim 2 see claim 2 rejection. For the rest of claim 3 feature see claim 1 and claim 2 rejections.

4. A method defined in claim 1, wherein the virtual operating units and their virtual actions are represented for the user after they have been addressed and specified.

For the feature of claim 1 see claim 1 rejection. For the rest of claim 4 feature see claim 2 rejection.

5. A method as defined in claim 1, wherein a linking of virtual operating units specified in a defined manner is carried out automatically by the data processing unit in order to take into account the machine and control configuration.

For the feature of claim 1 see claim 1 rejection. For the rest of claim 5 feature, see Fujita column 3, lines 56-61, "The CNC apparatus is **connected** (*linking*) through an interface 24 to external devices such as a paper tape reader, a paper tape puncher, a printer, a floppy disk drive unit (*all are defined manners*) etc. (not shown), so that the work program can be read from the paper tape reader to the CNC apparatus and an edited work program (*read and stored*) can be outputted from the CNC apparatus to the paper tape puncher."

6. A method as defined in claim 1, wherein the machine and control configuration is taken into account with the aid of a machine model comprising information concerning linkings of the virtual operating units representing the machine and control configuration.

For the feature of claim 1 see claim 1 rejection. For the rest of claim 6 feature see claim 5 rejection.

8. A method as defined in claim 6, wherein the machine model is generated by means stored linking information.

For the feature of claim 6 see claim 6 rejection. See claim 1 and 5 rejections.

9. A method as defined in claim 6, wherein the machine model linking the individual, virtual operating units of the machine tool in accordance with the machine and control configuration is stored in the data processing unit.

For the feature of claim 6 see claim 6 rejection. For the rest of claim 9 see claim 1 and claim 5 rejections, also see Fujita's FIG. 1.

12. A method as defined in claim 1, wherein for each virtual operating unit

See claim 1 rejection.

the machining operations realizable therewith are ascertained automatically by the data processing unit.

18. A method as defined in claim 12, wherein the sets of control data for the control program are ascertained automatically by the data processing unit on the basis of the addressed, virtual operating unit and the virtual machining operation correspondingly selected.

For the feature of claim 12 see claim 12 rejection. For the rest of claim 18 feature see claim 1 rejection.

19. A method as defined in claim 1, wherein the change in shape of a virtual workpiece due to machining thereof is represented by means of virtual actions of the virtual operating units.

For the feature of claim 1 see claim 1 rejection. Fujita column 1, lines 35-37, "where the workpiece configuration change (or the workpiece **cutting process**) is to be checked" (*change in shape*).

20. A method as defined in claim 19, wherein the change in shape of the virtual workpiece is ascertained by way of a cut calculation.

See claim 19 rejection.

21. A method as defined in claim 9, wherein the sets of control data of the control program are decoded and interpolated by the data processing unit in the same way as in the decoder and an interpolator of the machine control for the operating units of the machine tool.

For the feature of claim 9 see claim 9 rejection. In Fujita's disclosure, the input control data would have to be **processed** (*including decoded and interpolated*) the same way as in the machine control for the operating units so the data can be used in machining the workpiece.

22. A method as defined in claim 21, wherein the virtual actions of the virtual

For the feature of claim 21 see claim 21 rejection. For the rest of the claim 22

operating units are ascertained and represented during the interpolation using the machine and control configuration.

feature see claim 1 and 21 rejections.

23. A method as defined in claim 22, wherein the machine model is used during the interpolation for ascertaining the virtual actions.

For the feature of claim 22 see claim 22 rejection. For the rest of the claim 23 feature see claim 1 and 21 rejections.

24. A method as defined in claim 19, wherein the machining of virtual workpiece is represented at any time on said virtual workpiece.

For the feature of claim 19 see claim 19 rejection. For the rest of the claim 24 feature see claim 1 and 21 rejections.

30. A method as defined in claim 1, wherein shape data of the virtual workpiece are ascertained for each set of control data.

For the feature of claim 1 see claim 1 rejection. For the 'shape data' feature see Fujita Figure 5, an image display (*shape is displayed, therefore there must be shape data ascertained for each set of control data*).

36. A programming system for generating a control program provide machining of a workpiece by means of operating units of a machine tool, comprising:

See Claim 1 rejection. Fujita's disclosure is also a 'programming system' machining of a workpiece.

- a. a data input unit for entering and/or changing information determining the control program the machine tool,
- b. a visualization device for representing said information, and
- c. a data processing unit adapted to convert information into sets of control data determining the control program and storing these program memory, wherein:

i. the data processing unit comprises a model visualization unit designed such that with at least one virtual operating unit of the machine tool and its virtual actions are representable by means of said visualization device,

ii. the model visualization unit interacts with the data input unit such that the virtual operating unit(s) are addressable via the data input unit and virtual actions are specifiable these virtual operating units, and

iii. the model visualization unit the virtual actions specified to the individual, virtual operating units are convertible into the sets of control data of the control program taking into account the machine and control configuration.

37. A programming system as defined in claim 36, wherein with the model visualization unit, all of the virtual operating units of the machine tool are representable on the visualization device in the form of a machine display, in accordance actual machine configuration.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 37 feature see claim 1 and claim 2 rejections.

38. A programming system as defined in claim 36, wherein the model visualization unit represents the virtual operating units and their virtual actions on the visualization device taking into account machine and control configuration of the machine tool.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 38 feature see claim 1 and claim 2 rejections.

39. A programming system as defined in claim 36, wherein the model visualization unit represents the virtual operating units and their virtual actions on the visualization device after they have been addressed and specified.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 39 feature see claim 1 and claim 2 rejections.

40. A programming system as defined in claim 36, wherein a linking of virtual operating units specified in a defined manner takes place by means a model configuration unit interacting with the model visualization unit, in order to take into account the machine and control configuration.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 40 feature see claim 1, claim 2, and claim 5 rejections.

41. A programming system as defined in claim 36, wherein the machine and control configuration is taken into account with the aid of a machine model generated by the model visualization unit, said machine model comprising information concerning linkings of the virtual operating units representing the machine and control configuration.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 41 feature see claim 1, claim 2 and claim 5 rejections.

43. A programming system as defined in claim 41, wherein the machine model is generatable by means of linking information from a model configuration unit.

For the feature of claim 41 see claim 41 rejection. For the rest of claim 43 feature see claim 1, and claim 5 rejections.

44. A programming system as defined in claim 41, wherein the data processing unit has a main memory for storage of the machine model linking the individual,

For the feature of claim 41 see claim 41 rejection. For the rest of claim 44 feature see claim 1, and claim 5 rejections.

virtual operating units of the machine tool in accordance with the machine and control configuration.

47. A programming system as defined in claim 36, wherein a function allocation unit is allocated to the model visualization unit, the machining operation realizable with each virtual operating unit being ascertainable for each operating unit with said function allocation unit.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 47 feature see claim 1 and claim 2 rejections.

52. A programming system as defined in claim 51, wherein the function allocation unit presents the list with the machining operations allocated to the respective virtual operating units via the model visualization unit so as to be selectable for a user.

For the feature of claim 51 see claim 51 rejection. For the rest of claim 52 feature see claims 1 and 2 rejections (*function allocation is done via soft key selections in Fujita's disclosure*).

53. A programming system as defined in claim 47, wherein the model visualization unit automatically ascertains the sets of control data for the control program on the basis of the addressed operating unit and the virtual machining operation selected accordingly.

For the feature of claim 47 see claim 47 rejection. For the rest of claim 53 feature see claim 18 rejection.

54. A programming system as defined claim 36, wherein the model visualization unit represents the change in shape of a virtual workpiece by way of machining thereof by means of virtual actions the virtual operating units.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 54 feature see claim 19 rejection.

55. A programming system as defined in

claim 54, wherein the change in shape of the virtual workpiece ascertainable by way of a cut calculation unit.

For the feature of claim 54 see claim 54 rejection. For the rest of claim 55 feature see claim 20 rejection.

56. A programming system as defined in claim 36, wherein the model visualization unit has a decoder and an interpolator for the sets of control data of the control program corresponding a decoder and an interpolator of the machine control for the operating unit of the machine tool.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 56 feature see claim 21 rejection.

57. A programming system as defined in 56, wherein the interpolator ascertains the virtual actions of the virtual operating units using the machine and control configuration and the model visualization unit represents these on the visualization device.

For the feature of claim 56 see claim 56 rejection. For the rest of claim 57 feature see claim 1, claim 2, and claim 22 rejections.

58. A programming system as defined in claim 57, wherein the interpolator is used to ascertain the virtual actions of the machine model.

For the feature of claim 56 see claim 56 rejection. For the rest of claim 57 feature see claim 1, claim 2, and claim 23 rejections.

59. A programming system as defined in claim 54, wherein the model visualization unit is designed such that machining of the virtual workpiece is representable at any time on said virtual workpiece.

For the feature of claim 54 see claim 54 rejection. For the rest of claim 59 feature see claim 1, claim 2, and claim 24 rejections.

65. A programming system as defined in claim 36, wherein the model visualization unit ascertains shape data of the virtual workpiece for each set of control data.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 65 feature see claim 30 rejections.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,315,523 by Naoki Fujita et al. (hereinafter "Fujita"), in view of U.S. Patent No. 5,691,909 by Daniel D Frey et al. (hereinafter "Frey").

CLAIM

7. A method as defined in claim 6, wherein the machine model comprises a basic configuration of the virtual operating units of the machine tool extendible by the user.

Fujita / Frey

For the feature of claim 6 see claim 6 rejection. Fujita teaches all aspects of claim 7, but he does not mention 'basic configuration' specifically, however, Frey teaches it in an analogous prior art. In Frey's column 4, lines 62 through column 5, line 4, "The simulation is based on a **homogeneous transformation matrix (HTM) model (basic configuration)** of the machine. HTM models have been used for years in modeling machine tools. However, HTM models are typically used only to determine the accuracy of the location of the tool. The method of the present invention predicts accuracy in size, form, and profile of specific parts to be made on the machine tool. The essential feature to achieving the forgoing result

is utilizing the tool's location, orientation, velocity, and shape to calculate a set of discrete points on the surface of a part."

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Fujita's disclosure of the control program for machining a workpiece by using a basic configuration taught by Frey, for the purpose of predicting results in machining a workpiece (Frey, column 4, line 67).

42. A programming system as defined in claim 41, wherein the machine model comprises a basic configuration of the virtual operating units of the machine tool extendible by the user.

For the feature of claim 41 see claim 41 rejection. For the rest of claim 42 feature see claim 7 rejection.

8. Claims 10-11, 25-29, 31-35, 45-46, 60-64, and 66-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,315,523 by Naoki Fujita et al. (hereinafter "Fujita"), in view of U.S. Patent No. 6,553,268 by Marvin J. Schwenke et al. (hereinafter "Schwenke").

CLAIM

10. A method as defined in claim 6, wherein the machine model is utilized in the data processing unit in the form of a data tree structure.

Fujita / Schwenke

For the feature of claim 6 see claim 6 rejection. Fujita teaches all aspects of claim 10, but he does not mention 'data tree structure' specifically, however, Schwenke teaches a tree structured machine in an analogous prior art. In Schwenke, column 29, lines 1-8, "to uniquely identify the machine, the editor 162a initially provides a floating name

box 154 prompting the user to enter a machine name. The machine name is used by the editor 162a to identify the correct machine module for a given industrial process. In the example above, the process is named 'AB1' and therefore, the machine module name is AB1 and AB1 is eventually placed at the top of the **tree representation in tree section** (see FIG. 17)."; see FIG. 7A, a machine model in a tree structure is represented. Also in claim 3, "The language extension set of claim 2 wherein the second extension set also includes a symbolic expression language for **referencing data items**, the symbolic expression language for navigating said **hierarchical machine tree**". It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Fujita's disclosure of the control program for machining a workpiece by using a tree structured data taught by Schwenke, for the purpose to identify the interrelationships of a machine and control configuration (Schwenke, column 5, lines 17-19).

11. A method as defined claim 9, wherein the data tree structure has the form of a hierarchical data tree structure.

For the feature of claim 9 see claim 9 rejection. For the rest if claim 11 feature see claim 10 rejection.

25. A method as defined claim 1, wherein the virtual actions of virtual

For the feature of claim 1 see claim 1 rejection. Fujita teaches all aspects of

operating units are visualized in machining sequence provided for a machining of the virtual workpiece or in a reverse machining sequence.

claim 25, but he does not mention 'a reverse machining sequence' specifically, however, Schwenke teaches it in an analogous prior art. In Schwenke's column 27, lines 7-10, "Normal functions can be performed either in **forward** or **reverse directions** without damaging a workpiece or an associated machine's components."

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Fujita's disclosure of the control program for machining a workpiece by using a reverse machining sequence taught by Schwenke, for the purpose of performing the functions inverse function (Schwenke column 27, line 14).

26. A method as defined in claim 25, wherein in addition to the sets of control data, auxiliary data allowing a visualization of the virtual actions in a reverse machining sequence are generated for each set of control data taking into account the machine tool and control configuration.

For the feature of claim 25 see claim 25 rejection. Fujita teaches all aspects of claim 26, but he does not mention 'auxiliary data' specifically, however, Schwenke teaches it in an analogous prior art. In Schwenke, column 44, last paragraph, "After all required physical and operational characteristics of machine components are completely defined (*auxiliary data*) using the editors described above, the user would instruct the programming terminal to compile the entire template tree." -- it's obvious to a person of ordinary skill in the art to store the data in a 'chained' format. It would have been obvious to a person of ordinary skill in the art at the time of

the invention was made to supplement Fujita's disclosure of the control program for machining a workpiece by using a auxiliary taught by Schwenke, for the purpose of mapping procedures with their data (Schwenke, columns 44-45).

27. A method as defined in claim 26, wherein the auxiliary data are allocated to each set of control data in the form of a set of auxiliary data.

For the feature of claim 26 see claim 26 rejection. For the rest of claim 27 feature see claim 1 and 26 rejections.

28. A method as defined in claim 27, wherein the sets of auxiliary data are stored a chained set.

For the feature of claim 27 see claim 27 rejection. For the rest of claim 28 feature see claims 1 and 26 rejections.

29. A method as defined in claim 27, wherein the set of auxiliary data comprises a set transition and/or status data.

For the feature of claim 27 see claim 27 rejection. Fujita teaches all aspects of claim 26, but he does not mention 'status data' specifically, however, Schwenke teaches it in an analogous prior art. See Schwenke column 1, lines 25-29, "a stored program is executed to examine the condition of specific sensing devices on the controlled equipment, and to energize or de-energize selected operating devices on that equipment contingent upon the **status** of one or more of the examined sensing devices." And Schwenke, column 11, lines 3-17, "The processor module 64 executes a **control program** defined by the user which samples input signals received via the input module 66 along input bus 68 and based upon the **status**

of those inputs, activates or deactivates appropriate output lines of output bus 70 connected to the output module 65." It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Fujita's disclosure of the control program for machining a workpiece by using a status data taught by Schwenke, for the purpose of showing program status (Schwenke column 11, lines 13-17).

31. A method as defined in claim 30, wherein the shape data are stored in the set of auxiliary data.

For the feature of claim 30 see claim 30 rejection. For the rest of claim 31 feature see claim 26 rejection.

32. A method as defined in claim 28, wherein not only the control program but also the chained list is accessed and the corresponding set of auxiliary data are read from the chained list for each set of control data.

For the feature of claim 28 see claim 28 rejection. For the rest of claim 32 feature see claim 26 rejection.

33. A method as defined in claim 32, wherein not only the set of control data to be processed but also the associated of auxiliary data are determined same time the data processing unit.

For the feature of claim 32 see claim 32 rejection. For the rest of claim 33 feature see claim 26 rejection.

34. A method as defined in claim 28, wherein the chained list stored and a set of auxiliary data is clearly allocated to each set of control data.

For the feature of claim 28 see claim 28 rejection. For the rest of claim 34 feature see claim 26 rejection.

35. A method as defined in claim 26, wherein sets of control data and

For the feature of claim 26 see claim 26 rejection. For the rest of claim 35

auxiliary data are recorded with the data processing unit in machining sequence or reverse machining sequence and represented by the virtual operating units and virtual actions.

feature see claim 25 and claim 26 rejections.

45. A programming system as defined in claim 41, wherein the machine model is available to the data processing unit in the form of a data tree structure.

For the feature of claim 41 see claim 41 rejection. For the rest of claim 45 feature see claim 10.

46. A programming system as defined in claim 45, wherein the data tree structure has the form of a hierarchical data tree structure.

For the feature of claim 45 see claim 45 rejection. For the rest of claim 46 feature see claim 10.

60. A programming system as defined claim 36, wherein the virtual actions of the virtual operating units are visualizable in a machining sequence provided for a machining of the virtual workpiece or in a reverse machining sequence.

For the feature of claim 36 see claim 36 rejection. For the rest of claim 60 feature see claim 25.

61. A programming system as defined claim 60, wherein in addition to generating said sets of control data, the model visualization unit generates auxiliary data for each set of control data taking into account the machine tool and control configuration, said auxiliary data permitting a visualization of the virtual actions in a reverse machining sequence.

For the feature of claim 60 see claim 60 rejection. For the rest of claim 61 feature see claim 26.

62. A programming system as defined in

For the feature of claim 61 see claim 61

claim 61, wherein the model visualization unit allocates the auxiliary data to each set of control data in the form of set of auxiliary data.

rejection. For the rest of claim 62 feature see claim 27.

63. A programming system as defined in claim 62, wherein the model visualization unit stores the sets of auxiliary data in a chained list.

For the feature of claim 62 see claim 62 rejection. For the rest of claim 63 feature see claim 28.

64. A programming system as defined in claim 62, wherein the set of auxiliary data comprises a set of transition and/or status data.

For the feature of claim 62 see claim 62 rejection. For the rest of claim 64 feature see claim 29.

66. A programming system as defined in claim 65, wherein the model visualization unit stores the shape data in the set of auxiliary data.

For the feature of claim 65 see claim 65 rejection. For the rest of claim 66 feature see claim 31.

67. A programming system as defined in claim 63, wherein the model visualization unit is designed such that it accesses not only the control program but also the chained list, and the corresponding set of auxiliary data is readable from the chained list for each set of control data.

For the feature of claim 63 see claim 63 rejection. For the rest of claim 67 feature see claim 32.

68. A programming system as defined claim 67, wherein the model visualization unit determines by means of an indicator unit not only the set of control data to be processed, but also the associated set of auxiliary data.

For the feature of claim 63 see claim 63 rejection. For the rest of claim 67 feature see claim 33.

69. A programming system as defined claim 61, wherein the model visualization unit is designed such that with it sets of control data and auxiliary data are recordable in machining sequence in reverse machining sequence and are representable by way of the virtual operating units and virtual actions.

For the feature of claim 61 see claim 61 rejection. For the rest of claim 69 feature see claim 25.

70. A programming system as defined in claim 63, wherein the data processing unit has a system program memory storing the control program.

For the feature of claim 63 see claim 63 rejection. For the rest of claim 70 feature see claim 1 (see FIG. 1, *Fujita's system has system program memory*).

71. A programming system as defined in claim 70, wherein the chained list is stored in the system program memory and that a set of auxiliary data is clearly allocated to each set of control data.

For the feature of claim 70 see claim 70 rejection. For the rest of claim 71 feature see claim 34.

9. Claims 13-17, and 48-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,315,523 by Naoki Fujita et al. (hereinafter "Fujita"), in view of U.S. Patent No. 5,586,224 by Toshiyasu Kunii et al. (hereinafter "Kunii").

CLAIM

13. A method as defined in claim 12, wherein a set of filter data is generated for ascertaining the realizable machining operation.

Fujita / Kunii

For the feature of claim 12 see claim 12 rejection. Fujita teaches all aspects of claim 13, but he does not mention 'filter data' specifically, however, Kunii teaches it in an analogous prior art. In Kunii column 7, lines 4-5, "Data defining the model is stored in the computer on a database." And Kunii column 8, lines 6-10, "The data constituting the control

graphs are determined from the motions of the model obtained after applying actual motions to the model and **analyzing** (*filter data*) the results, and are stored in the database." Further, column 8, lines 18-20, "On the basis of the **data** input into the database, and particularly the control graphs showing all of the forces on each joint over time as the **model** goes through a particular motion or activity (*realizable machining operation*), it is possible to design new motions (the seventh step of the flow chart). Thus, the movement of a robot may be programmed or a numerical **control program** for working a **machine tool** may be created starting with the information which is already available in the database.

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement Fujita's disclosure of the control program for machining a workpiece by using a filter data taught by Kunii, for the purpose of fast accessing data.

14. A method as defined in claim 13, wherein the set of filter data is generated on the basis of the machine and control configuration.

See claim 13 rejection.

15. A method as defined claim 13, wherein the set of filter data is ascertained independently by the data processing unit in accordance with the

See claim 13 rejection.

machine and control configuration.

16. A method as defined in claim 13, wherein a list of machining operations performable with the respective virtual operating unit is selected from a list of all the possible machining operations with the set of filter data.

See claims 1 and 13 rejections.

17. A method as defined in claim 16, wherein the list with the machining operations allocated to the respective virtual operating unit is presented so as to be selectable for a user.

See claims 1, 2, and 16 rejections.

48. A programming system as defined in claim 47, wherein a set of filter data is generatable ascertaining realizable machining operation.

For the feature of claim 47 see claim 47 rejection. For the rest of claim 48 feature see claim 1, and claim 5 rejections.

49. A programming system as defined in claim 48, wherein the set of filter data is generatable on the basis of the machine and control configuration.

For the feature of claim 48 see claim 48 rejection. For the rest of claim 49 feature see claim 13 rejection.

50. A programming system as defined in claim 48, wherein model configuration generates the set of filter data in accordance with the machine and control configuration and transmits this set of filter data to the function allocation unit.

For the feature of claim 48 see claim 48 rejection. For the rest of claim 50 feature see claim 13 rejection.

51. A programming system as defined in claim 48, wherein the set of filter data, the function allocation unit selects from

For the feature of claim 48 see claim 48 rejection. For the rest of claim 51 feature see claim 13 rejection.

a list of all possible machining operations
a list of machining operations
performable with the respective virtual
operating units.

Conclusion

The following summarizes the status of the claims:

35 USC § 102 rejection : Claims 1-6, 8-9, 12, 18-24, 30, 36-41, 43-44, 47, 52-59,
and 65

35 USC § 103 rejections: 7, 10-11, 13-17, 25-29, 31-35, 42 45-46, 49-51, 60-64,
and 66-71

Any inquiry concerning this communication or earlier communications from
the examiner should be directed to Chih-Ching Chow whose telephone number is
571-272-3693. The examiner can normally be reached on 7:00am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the
examiner's supervisor, Tuan Dam can be reached on 571-272-3695. The fax phone
number for the organization where this application or proceeding is assigned is
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Hoang Anthony Nguyen Ba

ANTONY NGUYEN-BA
PRIMARY EXAMINER

Art Unit: 2122

Chih-Ching Chow

Examiner

Art Unit 2122

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